When Temptation Hits You: The Influence of Weak versus Strong Food Temptations

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In daily life, people are often exposed to food temptations, such as ads for chocolate or friends offering cookies. This article examines how consumers respond to such food temptations. We investigate whether food temptations, differing in strength (weak vs. strong), lead consumers to eat more or rather help them in exerting self-control. The results of three experiments suggest that weak food temptations activate food-related thoughts, and lead to overconsumption. Strong food temptations, on the other hand, inhibit this desire to eat, and help consumers to control their food-intake.

In everyday life, consumers often are exposed to food temptations; in ads, in stores, in bakeries, on coffee tables during social visits, or in one's own refrigerator… For example, food cues, like the scent of chocolate, might activate a craving for chocolate and increase the consumption of chocolate stored at home (Fedoroff, Polivy, and Herman 2003; Lambert and Neal 1992). However, salient temptations (e.g. an ad about delicious chocolate) might also remind consumers of their food restraint objectives, and thus facilitate self-control (Fishbach, Friedman, and Kruglanski 2003). In other words, the confrontation with a food temptation might help as well as hurt the consumer's resistance against subsequent food offers. In this article we attempt to find out when temptations prevent and when they facilitate self-control consistent behaviors.

Prior research supports the common intuition that food temptations tend to increase consumption. Larger package sizes increase consumption (Wansink 1996) and stockpiling accelerates the consumption rate of convenience goods due to a higher salience of the food products (Chandon and Wansink 2002). These findings and observations from everyday life suggest that food temptations constitute a permanent threat to the accomplishment of consumers' long term goals, like food restraint goals.

Food temptations may also have an indirect effect on consumption quantity. Resisting food temptations requires self-control. When the desire for a given immediate behavior (e.g. eating) is greater than the consumer's willpower to achieve long-term goals (e.g. food intake control), self-control is lost (Hoch and Loewenstein 1991; Loewenstein 1996; Metcalfe and Mischel 1999). Attention to inhibitory goals seems to play an important role in the balance between temptation and restriction. Inhibitory control fails when attention is diverted from inhibitory goals (Baumeister et al. 1998), and narrowed to the most salient cue (Ward and Mann 2000). Because trying to avoid eating food keeps the mental representation of a food temptation active, the most salient cue is–ironically–often the food itself (Wegner 1994). The focus on food cues that seems to be enhanced by self-control attempts therefore might result in increased consumption when attention is distracted. In support of this indirect effect of self-control attempts on the consumption of tempting food, Shiv and Fedorikhin (1999) found that limitations of processing resources increased preference for affect-laden food (i.e. chocolate cake) over less affect-laden food (i.e. fruit salad) for people with weak self-control capacity.

Together, the findings described above all corroborate the common intuition that food temptations are detrimental to the control of food intake in many circumstances. However, some recent findings in literature (Fishbach et al. 2003; Gilbert et al. 2004) suggest that food temptations may actually enhance self-control, possibly resulting in decreased consumption. Indeed, food temptations have been shown to activate inhibitory goals (Fishbach et al. 2003), which probably help controlling food consumption. In all, then, food temptations may sometimes increase and sometimes decrease food consumption through the activation of inhibition goals. However, little is known about the circumstances that determine whether an increase or decrease is obtained. In the current article, we focus on temptation strength as an important situational aspect. In particular, we investigate how food temptation strength may affect inhibitory control.

TWO POSSIBLE MECHANISMS OF INHIBITORY CONTROL BY MEANS OF FOOD TEMPTATIONS

From previous research, two possible mechanisms for the effect of food temptations on inhibitory control can be derived. These alternative mechanisms make opposing predictions with respect to the effect of the strength of the food temptation on consumption.

The Inoculation Perspective

A first mechanism may be derived from an analogy with inoculation theory (McGuire and Papageorgis 1961). This term is drawn from the public health practice of administering a weakened form of a viral infection in order to give people immunity to a stronger variant of the same viral infection. Inoculation theory states that people will better resist a persuasive attack on their belief when they have first been exposed to a weak persuasive attack on their belief (= inoculation). A weak persuasive attack activates defensive mechanisms supporting the belief that is attacked. These activated mechanisms help warding off a subsequent strong attack on the belief. It is important, however, that the initial attack does not overwhelm the defensive mechanisms. Otherwise, the belief you wanted to strengthen will get weaker and possibly even shift in the opposite direction. This inoculation has been shown to be effective in inducing resistance to alcohol use (Godbold and Pfau 2000) and negative comparative advertising (Kamins and Asseal 1987; Pfau 1992). Confrontation with temptations may initiate a similar process. An initial weak temptation may activate defensive mechanisms (viz.

the inhibition goal). This “inoculation” may help a consumer resist subsequent stronger temptations that might have otherwise overruled the consumer’s defenses. The application of the “inoculation” theory to food temptations implies that a weak preceding temptation will strengthen consumers’ food-intake regulation in comparison with strong preceding temptations. The weak food temptations would activate self-control mechanisms, whereas the strong food temptations would be too strong and lead to increased craving and hence increased consumption.

The Critical Level Perspective

A quite different prediction may be derived from Gilbert et al.’s (2004) finding that active attempts to solve a problem arise only when the problem becomes serious. People’s problem solving strategies seem to be triggered only by *critical* levels of hedonic states because they expect intense states (e.g. pain from a bruised leg) to last longer than mild ones (e.g. pain from a sleeping leg). Intense hedonic states are overestimated (Gilbert et al. 1998) and trigger self-control strategies, whereas mild states are underestimated and therefore linger unsolved (Snell, Gibbs, and Varey 1995). In the case of food temptations, a similar non-linear relationship might apply. A large number of candies may trigger concerns about health and diet whereas small numbers might not. This implies that people might paradoxically consume more candies when there are only a few candies in the kitchen cabinet than when a lot of candies are present (Gilbert et al. 2004). Interestingly, consumers seem to think that their consumption of vice products is a monotonic function of the amount they have at home (Wertenbroch 1998). Gilbert et al.’s (2004) theory implies that consumers might be wrong when they buy smaller amounts of vice foods to control their consumption. According to the critical level perspective, the consumed quantity should be lower when consumption is preceded by strong food temptations compared to weak food temptations.

In summary, it is not a priori clear if and in what direction the strength of a food temptation may affect consumption. The present research investigated whether food temptations, differing in strength (weak vs. strong), encourage or prevent self-control failure of food intake.

WHAT IS WEAK AND WHAT IS STRONG?

In order to test for the two mechanisms described above, we need to define what can be seen as a weak or a strong food temptation. The inoculation perspective implies that the weak temptation should not overwhelm the consumer, whereas the strong temptation should 'persuade' the consumer to eat. The critical level perspective implies that the strong temptation should exceed a certain threshold in order to trigger self-control strategies. In other words, both perspectives imply that the weak temptation should not overwhelm the consumers, whereas the strong temptation should exceed a certain critical level. Therefore, we define a weak temptation as food cues that arouse the desire to eat but that do not offer the opportunity to directly consume the cued food (e.g. pictures of food). A strong temptation is defined as food cues that arouse the desire to eat and also offer the opportunity to consume the food directly (e.g. a basket full of delicious cookies). The main difference between both temptation types lies in the actionability of the temptation. The weak temptation is not overwhelming or threatening because the consumer cannot directly consume the temptation. The strong temptation, on the other hand, is overwhelming and threatening and can be consumed immediately. We assume that available food does exceed the threshold and is therefore more tempting than cued food.

In the following studies, we explore the effects of different temptation levels (no vs. weak vs. strong temptation) on the self-regulation of food intake. In a first study, we investigate the effects of different temptation levels on the consumed amount. In a second study, we try to explain the results of the first study by exploring which goals are activated by different temptation levels. A third and final study tests the causal mechanism that is suggested by the findings of the first two studies.

STUDY 1

In a first study, we wanted to test the inoculation perspective against the critical level perspective by manipulating temptation strength (no vs. weak vs. strong). Will weak food temptations make consumers more resistant, as the analogy with the inoculation perspective (McGuire and Papageorgis 1961) implies, or does it require strong temptations, as Gilbert et al.'s (2004) critical level perspective implies?

Method

Participants were 185 female undergraduate students (age between 18 and 25) that participated in partial fulfillment of a course requirement. They participated in groups of eight. The temptation conditions were run in separate sessions for procedural efficiency.

Temptation manipulation. On entering the laboratory, participants were given a knowledge task, which manipulated the temptation level. In the Weak Temptation-condition, participants were told that the manufacturer of the candy brand 'Quality Street®' was interested in consumer knowledge of the association between flavors and wrapper colors and shapes. Participants were asked to associate twelve pictures of the candies (of different colors and shapes) with the corresponding flavor of each candy (e.g. 'chocolate with strawberry cream'). Participants in the Strong Temptation-condition were given the same task as in the Weak Temptation-condition. In addition, a bowl filled with lots of these 'Quality Street' candies was present next to them. They were told that the candies were placed there because the pictures were not always very clear. They were not allowed to eat any candy during the knowledge task. Participants in the No Temptation-condition were asked to match ten colors with ten concepts (e.g. 'white' with 'snow and 'green' with 'grass').

Consumption task. Before participants had the opportunity to eat the 'Quality Street' candy after the completion of the knowledge task, they received the second task. Participants were given two bowls of the same volume, one with regular M&Ms® (400 grams), and the other with the 'new' crispy M&Ms (300 grams). They were told that they were participating in a comparative taste test of both types of M&Ms. The participants were allowed to eat as many of the M&Ms as they needed to evaluate the M&Ms on several dimensions (e.g. 'are they crunchy?', 'are they hard to resist?', 'do they have an appetizing aftertaste?', and 'do they have an intense flavor?').

After the taste test, the bowls were removed, and the experimenter weighed how many M&Ms had been consumed. Finally, participants had to indicate how much they liked M&Ms and 'Quality Street' candy (on a scale ranging from 0 to 100), which allowed us to exclude participants from the analyses who state, by responding '0', that they really do not like one of both. We also asked them how much time had elapsed since their last food intake before entering the lab, as a proxy of their hunger level.

Results

The 185 participants were screened by asking whether they liked M&Ms and 'Quality Street' candy. This screening procedure excluded 17 girls who did not like the candy (n = 13) or the M&Ms (n = 4). Additionally, nine outliers (i.e. 5.4%, defined as deviating at least 3 standard deviations from the mean in their respective conditions) were removed from the remaining 168 participants, leaving 159 participants in the analyses.

Quantity consumed. Figure 1 illustrates the results of study 1. An ANOVA testing the effect of Temptation on the consumed quantity of M&Ms, with liking for M&Ms (ranging from 1 to 100) as a covariate, revealed a significant main effect, $F(2, 155) = 3.56$, $p < .04$. This effect indicated that consumption increased in the Weak Temptation-condition (M = 18.3, SD = 12.61) compared to the No Temptation-condition (M = 14.4, SD = 8.78), $F(1, 155) = 3.32$, $p < .08$. However, in the Strong Temptation-condition (M = 13.1, SD = 9.46), participants consumed fewer M&Ms than in the Weak Temptation-condition, $F(1, 155) = 6.70$, $p < .02$. The strong temptation seemed to help participants in resisting the M&Ms, compared to the weak temptation. These results imply that weak food temptations lead to increased consumption, whereas strong food temptations seem to help consumers in exerting food-intake control.

Insert figure 1 about here

Discussion

Women consume more after exposure to a weak food temptation than after exposure to a strong food temptation. Having seen pictures of food temptations (e.g. candy), women eat more compared to having been tempted with real candy. Possibly, a weak temptation increases the appetite for (unhealthy) food and hence encourages unhealthy eating behavior when the opportunity is subsequently offered. A strong temptation does not encourage unhealthy eating behavior. Possibly it activates women's inhibitory goals, helping them to resist the food compared to the situation with the weak temptation. In other words, a strong temptation seems to trigger processes enhancing self-control of food intake whereas a weak

temptation does not. This is consistent with the prediction derived from Gilbert et al. (2004) that the activation of inhibitory goals might require a strong temptation. The interpretation of our results implies that a weak temptation may elicit positive thoughts related to food consumption but a strong temptation may evoke more diet-related thoughts. To test this further, we directly measured concept/goal activation resulting from the same temptation manipulations in the second study. We measured goal activation by means of a lexical decision task, with faster recognitions of words signifying activation of the corresponding concepts.

STUDY 2

Method

Participants were 121 female undergraduate students (age between 18 and 31) participating for partial fulfillment of a course requirement. They participated in groups of eight. The temptation conditions were run in separate sessions for procedural efficiency.

Temptation manipulation. Temptation level was manipulated as in study 1. The No Temptation-condition remained unchanged. The 'Quality Street' candy was replaced by 'Cote d'Or®' mini-chocolates, which exist in five different flavors. In the Weak Temptation-condition, participants were asked to match the pictures of the chocolates with the flavors. In the Strong Temptation-condition, participants were given the same task while a dish filled with about 40 chocolates was present next to them. The same cover story as in the first study was used.

Lexical Decision Task. Right after the temptation manipulation and before they had the opportunity to consume the chocolates, participants received the second task. This task consisted of a lexical decision task, programmed in Affect (Hermans et al. 2002), with faster recognitions of words signifying that the corresponding concepts are activated. Following a 2 sec warning screen including a fixation cross, a stimulus word appeared on the computer screen. Participants had to respond as quickly and accurately as possible by pressing a key to indicate whether the stimulus was a word or a pseudo-word. Response times in milliseconds and accuracy were recorded. To familiarize with the task, participants started with a practice

round of 10 trials (five neutral words and five pseudo-words). One hundred actual trials followed, including 30 target words related to food, dieting and temptation, 20 neutral words, and 50 pseudo-words. Of the 30 target words, 13 were related to inhibitory goals like dieting and health (e.g. 'healthy' and 'slim'), 10 were related to the taste of food and consumption (e.g. 'mouthwatering', and 'candy'), three were related to unhealthy things (e.g. 'fat' and 'unhealthy') and five were related to feelings of enjoyment (e.g. 'enjoy' and 'happy'). The 30 goal-related words were obtained from a pretest (n = 40) that also included the two temptation conditions, in which we asked participants which thoughts came to mind. Another pretest, in which participants (n = 23) were asked to group the 30 goal-related words, led us to the four groups described above.

Results and Discussion

None of the participants disliked the chocolates; therefore all 121 participants were kept in the analyses. We averaged the latencies for the 10 food-related words (dessert, food, appetizing, savoring, candy, sugar, temptation, mouthwatering, appetite and sweet, $\alpha = 0.78$) into the variable 'Food goal accessibility', and the latencies for the 13 diet/health related words (calories, diet, fruit, weight, healthy, vegetable, hunger, slim, model, thin, regret, sport and persistent, $\alpha = 0.79$) into the variable 'Diet goal accessibility'. We conducted a repeated measures ANOVA with the Type of goal (Food or Diet) as a within subjects independent variable, Temptation as a between subjects independent variable, and response times as the dependent variables. To control for the substantial inter-individual variability in latencies, we included the average response time on the neutral words as a covariate in the analysis. The ANCOVA revealed a significant interaction between the variable Type of goal and Temptation, $F(2, 111) = 5.58$, $p < .006$ (figure 2). Compared to the No Temptation-condition (M = 571.61, SD = 80.54), the Food goal was more activated in the Weak Temptation-condition (M = 551.95, SD = 64.87, $F(1, 111) = 5.77$, $p < .02$) and more inhibited in the Strong Temptation-condition (M = 611.30, SD = 105.27, $F(1, 111) = 19.98$, $p < .001$). For the Diet goal, there were no significant differences among the temptation conditions.

We also approached the interaction from the other angle. In the Strong Temptation-condition, the Food goal (M = 611.30, SD = 105.27) was recognized more slowly than the Diet goal (M = 576.12, SD = 90.74), $F(1, 111) = 15.95$, $p < .001$. There were no differences between the two goals for the other temptation conditions. This suggests that the strong temptation

inhibits positive food related thoughts compared to diet considerations. This inhibition then might result in a food intake control as the one observed in study 1.

Insert figure 2 about here

The results of study 2 show that a weak temptation arouses positive feelings (e.g. appetite and sweet) related to food consumption. The strong temptation, on the other hand, inhibits the positive food-related thoughts. We found no direct effect of temptation level on food intake inhibition concepts (i.e. Diet goal concepts).

STUDY 3

The previous studies suggest that (1) weak food temptations increase women's food intake because of an increase in the activation of an eating goal but that (2) strong food temptations decrease women's food intake because of the inhibition of the same eating goal. Both findings support the critical level perspective rather than the inoculation perspective. However, the present data do not offer a direct causal test of this critical level model. In a third study, we wanted to test the causal role of food goal activation by manipulating it externally. We activated the eating goal by means of an appetizing olfactory cue, a method that has been shown to increase eating behavior and craving for food (Fedoroff, Polivy, and Herman 2003; Lambert and Neal 1992).

According to the view that strong temptations inhibit the food goal activation, we should expect that the consumption increase due to the appetizing olfactory cue should be blocked in a Strong Temptation-condition. To test this, we manipulated the eating goal by means of the presence of an appetizing scent and we manipulated the temptation level as before but leaving out the Weak Temptation level (i.e. only the No Temptation and the Strong Temptation level). This level has become redundant at this point because the results of the first two studies are not consistent with the inoculation perspective. In addition, the effect of the weak temptation would be comparable to the effects of the scent manipulation because they both activate the eating goal. This implies that including this temptation level would offer no additional information.

Method

Participants were 146 female undergraduate students (age between 18 and 33) in partial fulfillment of a course requirement or in exchange for €6. They participated in groups of eight. The temptation conditions were run in separate sessions for procedural efficiency.

Scent manipulation. In order to activate the eating goal, we used the scent of freshly baked brownies. When participants entered, the lab was filled either with a scent of brownies (i.e. the Scent condition), or with a neutral scent (i.e. the No Scent condition). Prior research (Fedoroff et al. 2003; Lambert and Neal 1992) has shown that exposure to an olfactory food cue, here the delightful scent of brownies, induces craving, liking, and desire to eat the cued food (i.e. cake and chocolate).

Temptation manipulation. The temptation manipulations were identical to the No Temptation and the Strong Temptation-conditions of the first study ('Quality Street' candies).

Consumption task. Right after the temptation manipulation and before participants had the opportunity to consume the candy, they received the consumption task. This task was identical to the taste test in study 1. This taste test was conducted as soon as possible in the experimental session to prevent participants in the scent condition to adapt to the scent (Morrin and Ratneshwar 2003).
After the taste test, the bowls were removed, and the experimenter weighed how many M&Ms had been consumed. Finally, participants had to indicate how much they liked M&Ms and 'Quality Street' candy (on a scale ranging from 0 to 100), to correct for their liking of M&Ms and 'Quality Street' candy (excluding from the analyses participants that state they do not like the food by responding '0'). We again asked them how much time had elapsed since their last food intake before entering the lab, as a proxy of their hunger level.

Results and discussion

The screening procedure led us to exclude three girls who did not like the candy (n = 1) or the M&Ms (n = 2). Additionally, six outliers were removed (i.e. 4.2%, defined as deviating at least 3 standard deviations from the mean in their respective conditions), leaving 137 participants in the analyses.

Quantity consumed. A Temptation by Scent ANOVA on the consumed quantity of M&Ms with liking for M&Ms (ranging from 1 to 100) as a covariate revealed a significant main effect of Temptation, $F(1, 132) = 4.36$, $p < .04$. This effect showed that participants in the Strong Temptation-condition ($M = 16.05$, SD = 10.41) consumed fewer M&Ms than participants in the No Temptation-condition ($M = 21.10$, SD = 15.68). The main effect of Scent was not significant, $F(1, 132) < 1$. However, a two-way interaction (figure 3) between Scent and Temptation was obtained, $F(1, 132) = 3.87$, $p = .05$. In the No Temptation-condition, participants in the Scent-condition ($M = 24.16$, SD = 18.00) ate more than in the No Scent-condition ($M = 18.05$, SD = 12.05), $F(1, 132) = 4.51$, $p < .04$, which validates the appetizing effect of the olfactory cue. In the Strong Temptation-condition, in contrast, Scent did not increase consumption. In fact, consumption even decreased. In the Scent-condition, the strongly tempted participants ($M = 15.02$, SD = 10.20) consumed fewer M&Ms than the participants that had not been previously tempted ($M = 24.16$, SD = 18), $F(1, 132) = 8.41$, $p < .005$. These results suggest that the strong temptation treatment effectively inhibited the eating goal that was activated by the olfactory cue.

Insert figure 3 about here

GENERAL DISCUSSION

This article investigated whether food temptations, differing in strength (weak vs. strong), encourage or prevent self-control failure of food intake. We defined a weak temptation as food cues that arouse the desire to eat but that offer no opportunity to directly consume the cued food (e.g. pictures of food). A strong temptation was defined as food cues that arouse the desire to eat but that do offer the opportunity to consume the cued food directly (e.g. a bowl of candy). Our first study shows that female participants consumed more after exposure to a weak food temptation, whereas a strong food temptation seemed to prevent this self-control failure from occurring. In a second study, we found that weak temptations make positive food related concepts (e.g. appetite and sweet) more accessible. Strong temptations, on the other hand, inhibited the accessibility of these positive food related concepts and, in this way, facilitated self-control. No direct effect of food temptation level on food intake inhibition concepts was found. Our third study tested whether a strong food temptation is able

to block the activation of the eating goal. The data showed that a strong temptation inhibits the appetizing effect of an attractive food scent, again indicating that strong temptations seem to prevent self-control failure by the inhibition of the desire for food.

The results of the first two studies are consistent with the critical level perspective (Gilbert et al. 2004) that self-control strategies are triggered only by critical levels of hedonic states. The weak food temptation might not exceed this critical level, whereas the strong food temptation apparently does. Consistent with this interpretation, study 3 shows that the strong food temptation inhibits craving for food, helping consumers to control their food intake.

At first sight, our findings might seem to contradict with earlier research showing that higher salience of food leads to an increase in food intake (Chandon and Wansink 2002; Wansink 1996). Our article seems to suggest that high salience of foods leads to a decrease in food intake. However, in our article, participants were exposed to food temptations and were only *subsequently* exposed to the food they were asked to consume. Moreover, the salience of the consumed foods (i.e. the M&Ms) was constant over conditions. In the earlier research, participants were *immediately* exposed to the food they were requested to consume, and this food differed with respect to salience levels (e.g. by varying package sizes). Our findings suggest that strong food temptations might prevent the effects reported by Chandon and Wansink (2002) from occurring. In this way, our research can be seen as complementary to their research.

The findings of Shiv and Fedorikhin (1999) might also seem inconsistent with our findings. Their main finding was that limitations of processing resources increased preference for affect-laden food (i.e. chocolate cake) over less affect-laden food (i.e. fruit salad) when real alternatives were presented but not when (non-actionable) photographs of the food alternatives were presented. In the condition with high processing resources (which is comparable to our setting), they found no difference in preferences between the real food alternatives, which is comparable to our Strong Temptation-condition, and the symbolic food alternatives, which is comparable to our Weak Temptation-condition. In Shiv and Fedorikhin's research, the choice had to be made *immediately* upon seeing the food. In our research, however, there was a delay between the exposure to the food temptations ("symbolic" or "real") and the consumption task. In this way, our findings are complementary to theirs and allow to predict that pre-exposure to a strong temptation will

attenuate the interaction effect between presentation vividness and cognitive load that they reported.

We note that our findings are inconsistent with two alternative explanations. The first is derived from the self-control strength theory, which states that the exertion of self-control during a first task (e.g. resisting food temptations) leads to self-control failure in a subsequent task (e.g. overconsumption in a taste test) (Baumeister et al. 1998; Vohs and Heatherton 2000). This theory implies that participants in the Strong Temptation-condition, which is depleting because they need to resist the candy, should eat more M&Ms in the subsequent taste test. The results of study 1 yield the opposite pattern, rejecting ego depletion as an alternative explanation.

The other alternative explanation is based on self-perception theory (Bem 1972). The participants may have inferred their self-control capacity on the basis of their own behavior in the first phase. In the Weak-Temptation condition, they could not eat the 'Quality Street' candy and hence they could not infer anything about their self-control capacity. In the Strong Temptation-condition, however, they could have eaten the candies (although they had been urged not to). Their compliance with the request not to eat the candies may have strengthened these participants' belief that they were in control of their own consumption level. The attribution of successful regulatory control (Bem 1972) may have made it easier for them to resist the subsequent temptation. The self-perception explanation could hold for study 1, but is inconsistent with study 2. If participants in the Strong Temptation-condition feel more in control (i.e. like a dieter) concepts related to dieting should be more accessible than in the other conditions. We do not find support for this prediction in study 2.

IMPLICATIONS AND FUTURE RESEARCH

Our results support the counterintuitive idea that advertisements featuring food temptations might be more of a lure into overconsumption than placing food right in front of women. The mechanism behind these effects seems to be that pictures of food activate a desire to eat whereas the opportunity to consume food inhibits this desire. This explanation is tentative and suggests that threatening food temptations do not activate the dieting goal (compare to Fishbach et al. 2003) but inhibit the eating goal. The exact dynamics of how food exposure leads to increased and decreased food consumption needs to be explored further in subsequent research. It might, for example, be interesting to explore the effects of strong food

temptations on the consumed amount of differing salience levels (Chandon and Wansink 2002). Moreover, we defined a weak and strong food temptation as differing in actionability. It could also be interesting to compare the effects of a weak and strong food temptation differing in salience, namely a few candies versus a lot of candies. Strictly, our results are also only generalizable to female students. Generalization to men, and to other age groups, remains a matter for further research.

The results of the three studies imply that advertisements showing pictures of tempting food increase women's food consumption. However, tempting these consumers with real food leads them to restrict their food intake. Having candy in large stocks at home thus seems to help women with their attempts at controlling their food intake, whereas seeing pictures of food in magazines or on television might lead them to eat more when given the occasion.

REFERENCES

Baumeister, Roy F., Ellen Bratslavsky, Mark Muraven, and Dianne M. Tice (1998). "Ego-depletion: Is the active self a limited resource?", *Journal of Personality and Social Psychology*, 74, 1252-1265.

Bem, Daryl J. (1972). "Self-perception", in *Advances in Experimental Social Psychology*, ed. L. Berkowitz, New York: Academic Press, 1-62.

Chandon, Pierre and Brian Wansink (2002), "When Are Stockpiled Products Consumed Faster? A Convenience-salience Framework of Postpurchase Consumption Incidence and Quantity", *Journal of Marketing Research*, 39, 321-335.

Fedoroff, Ingri, Janet Polivy, and Peter C. Herman (2003), "The Specificity of Restrained versus Unrestrained Eaters' Responses to Food Cues: General Desire to Eat, or Craving for the Cued Food?", *Appetite,* 41(1), 7-13.

Fishbach, Arlene, Rohn S. Friedman, and Arie W. Kruglanski (2003), "Leading Us Not Unto Temptation: Momentary Allurements Elicit Overriding Goal Activation", *Journal of Personality and Social Psychology,* 84, 296-309.

Gilbert, Daniel T., Matthew D. Lieberman, Carey K. Morewedge, and Timothy D. Wilson (2004), "The Peculiar Longevity of Things Not So Bad", *Psychological Science,* 15(1), 14-19.

Gilbert, Daniel T., Elizabeth C. Pinel, Timothy D. Wilson, Stephen J. Blumberg, and Thalia P. Wheatley (1998), "Immune Neglect: A Source of Durability Bias in Affective Forecasting", *Journal of Personality and Social Psychology*, 75, 617–638.

Godbold, Linda C. and Michael Pfau (2000). "Conferring Resistance to Peer Pressure Among Adolescents: Using Inoculation Theory to Discourage Alcohol Use", *Communication Research*, 27, 411-437.

Hermans, Dirk, Jeroen Clarysse, Frank Baeyens, and Adriaan Spruyt (2002). "Affect (Version 3.0) Computer software", http://www.psy.kuleuven.ac.be/leerpsy/affect University of Leuven, Belgium.

Hoch, Stephen J. and George F. Loewenstein (1991), "Time-Inconsistent Preferences and Consumer Self-Control," *Journal of Consumer Research*, 17 (4), 492–507.

Kamins, Michael A. and Henry Assael (1987), "Two-sided Versus One-sided Appeals: A Cognitive Perspective on Argumentation, Source Derogation, and the Effect of Disconfirming Trial on Belief Change," *Journal of marketing Research*, 24, 29-39.

Lambert, Kelly G. and Tara Neal (1992), "Food-Related Stimuli Increase Desire to Eat in Hungry and Satiated Human Subjects," *Current Psychology*, 10 (4), 297-304.

Loewenstein, George F. (1996), "Out of Control: Visceral Influences on Behavior," *Organizational Behavior and Human Decision Process*, 65, 272-292.

McGuire, William J. and Demetrios Papageorgis (1961), "The Relative Efficacy of Various Types of Prior Belief-defense in Producing Immunity Against Persuasion", *Journal of Abnormal and Social Psychology*, 62, 327-337.

Metcalfe, Judy and Walter Mischel (1999), "A Hot/cool-system Analysis of Delay of Gratification: Dynamics of Will Power", *Psychological Review*, 106, 3-19.

Morrin, Maureen and S. Ratneshwar (2003), "Does it Make Sense to Use Scents to Enhance Brand Memory?," *Journal of Marketing Research*, 40 (1), 10-26.

Pfau, Michael (1992), "The Potential of Inoculation in Promoting Resistance to the Effectiveness of Comparative Advertising Messages," *Communication Quarterly*, 40(1), 26-44.

Shiv, Baba and Alexander Fedorikhin (1999), "Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making," *Journal of Consumer Research*, 26 (December), 278–292.

Snell, Jason, Brian J. Gibbs, and Carol Varey (1995), "Intuitive Hedonics: Consumer Beliefs about the Dynamics of Liking", *Journal of Consumer Psychology*, 4, 33–60.

Vohs, Kathleen D. and Todd F. Heatherton (2000), "Self-regulatory Failure: A Resource-depletion Approach", *Psychological Science*, 11(3), 249-254.

Wansink, Brian (1996), "Can Package Size Accelerate Usage Volume?", *Journal of Marketing*, 60(3), 1-14.

Ward, Andrew and Traci Mann (2000), "Don' t Mind If I Do : Disinhibited Eating under Cognitive Load", *Journal of Personality and Social Psychology*, 78(4), 753-763.

Wegner, Daniel M. (1994), "Ironic Processes of Mental Control", *Psychological review*, 101, 34-52.

Wertenbroch, Klaus (1998), "Consumption Self-Control by Rationing Purchase Quantities of Virtue and Vice", *Marketing Science*, 17(4), 317-337.

FIGURE 1:

Consumption as a function of temptation, study 1

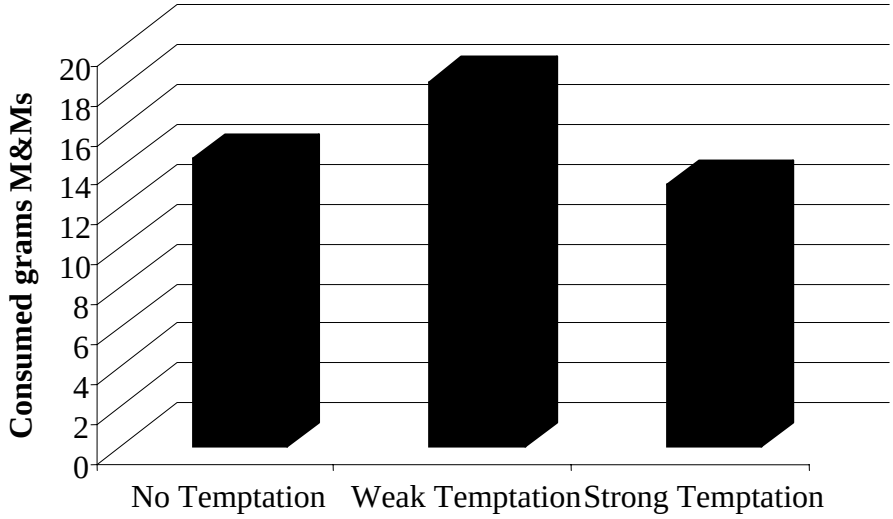

FIGURE 2:

Reaction time (ms) food related words versus inhibitory goals related words, study 2

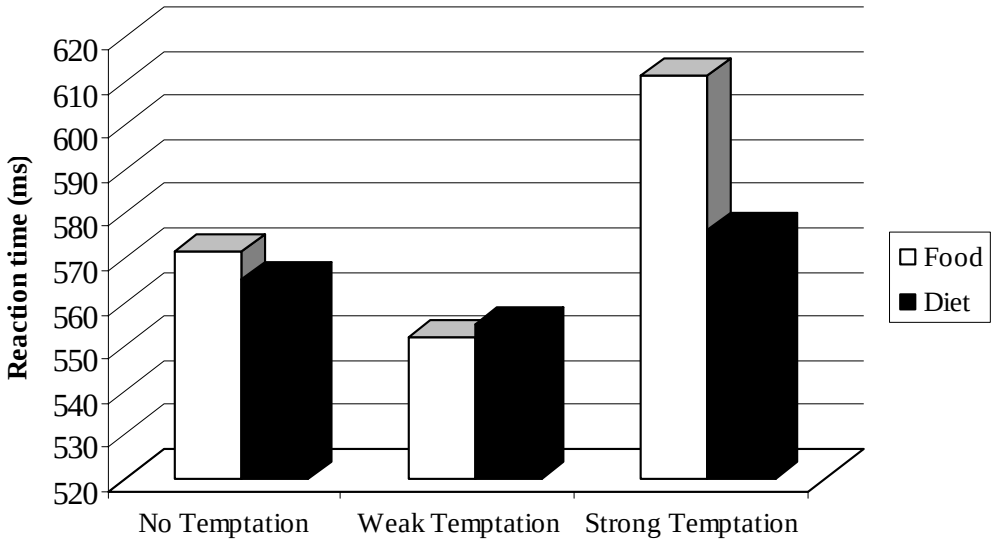

FIGURE 3:

Consumption as a function of temptation and scent, study 3